

**BUILDING MATERIALS**  
**(CIVL 4221)**

**Time Allotted : 3 hrs**

**Full Marks : 70**

*Figures out of the right margin indicate full marks.*

*Candidates are required to answer Group A and  
any 5 (five) from Group B to E, taking at least one from each group.*

*Candidates are required to give answer in their own words as far as practicable.*

**Group - A**  
**(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) Percentage of Silica in a good brick earth lies between  
(a) 10%-20%      (b) 20%-40%      (c) 50%-60%      (d) 30%-50%.
  - (ii) The ultimate tensile strength of high tensile steel in N/mm<sup>2</sup> is  
(a) 600              (b) 1000              (c) 1500              (d) 2000.
  - (iii) Di-calcium silicate  
(a) Hydrates rapidly                              (b) Generates less heat of hydration  
(c) Reacts with water only                      (d) Hardens rapidly.
  - (iv) Separation of coarse aggregates from mortar during transportation, is known  
(a) Bleeding              (b) Creep              (c) Segregation              (d) Shrinkage.
  - (v) Use of retarders in concrete  
(a) shortens the setting time              (b) reduces the early strength of concrete  
(c) increases period of curing              (d) all of the above
  - (vi) The maximum bulking of sand is likely to occur at a moisture content of  
(a) 5%              (b) 8%              (c) 11%              (d) 14%
  - (vii) Quick lime is  
(a) Calcium oxide                              (b) Calcium hydroxide  
(c) Calcium carbonate                      (d) Calcium silicate.
  - (viii) Slump test of concrete is a measure of its  
(a) impact value                              (b) compressive strength  
(c) tensile strength                              (d) consistency.
  - (ix) The apex line of the slopping roof is called  
(a) ridge                              (b) eaves  
(c) verge                              (d) purlins.

- (x) The type of bond in which every course contains both header and stretchers is called
- |                    |                  |
|--------------------|------------------|
| (a) Flemish Bond   | (b) English Bond |
| (c) Stretcher Bond | (d) Raking Bond. |

**Group- B**

2. (a) Differentiate between first class bricks and second class bricks.  
(b) Briefly explain any four harmful ingredients in normal clay bricks.  
[[CO1](Remember/LOCQ)]  
**4 + 8 = 12**
3. Write short notes on (i) Compressive strength test of cement (ii) Soundness test of cement.  
[[CO2](Remember/LOCQ)]  
**(6 + 6) = 12**

**Group - C**

4. (a) Explain the following terms as far as lime is concerned:  
(i) Calcinations and Hydraulicity  
(ii) Quick lime  
(iii) Slaked lime.  
(b) State the carbon content and functions of the following metals:  
(i) Pig Iron  
(ii) Cast Iron  
(iii) Wrought Iron  
(iv) Galvanized Iron.  
[[CO4,CO6](Remember/LOCQ)]  
**6 + 6 = 12**
5. (a) Write short notes on:  
(i) Paint (ii) Varnishes (iii) Distempers.  
(b) Write short notes on  
(i) Defects in timber  
(ii) Characteristics of good mortar.  
[[CO4](Apply/IOCQ)]  
**6 + 6 = 12**

**Group - D**

6. (a) Write short notes on  
(i) Load Bearing Wall  
(ii) Partition Wall.  
[[CO6](Remember/LOCQ)]  
(b) Write a short notes on different types of shallow foundation with neat sketches.  
[CO6,Remember/LOCQ]  
**6 + 6 = 12**

7. (a) What are the different sizes of doors generally used in residential buildings and public buildings? [[CO1](Remember/ LOCQ)]  
(b) Write short notes on the following: (i) Tiled Flooring (ii) Marble Flooring (iii) Mosaic Flooring. [[CO6](Apply/IOCQ)]  
**4 + 8 = 12**

**Group - E**

8. Plan a dog legged stair for a building in which the vertical distance between the floors is 3.6 m. The stair hall measures 3 m × 5 m. [[CO1](Evaluate/HOCQ)]  
**12**
9. (a) Write down the required characteristics of a floor to perform its functions properly.  
(b) Describe with the help of a neat sketch the different parts of a King-post truss. [[CO6](Remember/LOCQ)]  
**4 + 8 = 12**
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Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	66.67	20.83	12.50

**Course Outcome (CO):**

After going through this course, the students will be able to:

1. Impart knowledge regarding the various building and general construction products and their quality, durability and availability.
2. Impart knowledge regarding the various types of properties, uses and variety of materials used in the construction industry.
3. Study the behavior of concrete at its fresh and hardened state
4. Study about the concrete design mix.
5. Expose themselves to various quality control aspects of the civil engineering materials.
6. Learn and use the terms common in the building industry.

\*LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question; HOCQ: Higher Order Cognitive Question.

